Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

A POSSIBLE LIMITING EFFECT OF GROUND-WATER UPON EOLIAN EROSION

JOSEPH E. POGUE
U.S. National Museum, Washington

Mr. C. R. Keyes, in a recent article in the *Journal of Geology*,[1] discusses the well-known fact that in arid regions erosion proceeds independently of sea-level and often is effective even below it. He sets a limit, however, to the depth to which eolian erosion can extend, in these terms: "Where the general ground-water level nearly coincides with that of the plains-surface, deflation can proceed no farther. This level, which is perfectly independent of sea-level, can never be very far below it." In this connection, it may be of interest to call attention to some suggestions regarding the effect which ground-water, existing under a special condition, may have upon erosion.

Mr. H. J. L. Beadnell,[2] in 1909, describes the Kharga Oasis, which is a depression in the Lybian Plateau of Egypt, worn down beneath the general level of the country by the differential effect of subaerial denudation acting on rock masses of varying hardness and composition. He states that the oasis was at one time the bed of an extensive lake, and, from the finding of some fragments of pottery *in situ* in the base of the lacustrine deposits, concludes that the lake was contemporaneous with man. In regard to its origin, he says:

> There is an explanation which it is advisable to keep in mind, though it has never hitherto, as far as I am aware, been advanced as a possible cause of the formation of lakes. . . . . There is little doubt that the beds which we have named the "Surface-Water Sandstone," and which are now exposed in places on the floor of the oasis, were originally entirely covered by impervious clays and contained artesian water under pressure. It is conceivable, therefore, that when

---

[1] "Base Level of Eolian Erosion," *Jour. Geol.*, XVII (1909), 659–63.

[2] *An Egyptian Oasis: An Account of the Oasis of Kharga.* London, 1909; abstract, *Geol. Mag.*, VI (1909), 476–78.

> those beds became exposed at the surface, owing to the removal of the overlying confining strata, their contained water escaped in such quantities as to have given rise to a lake of considerable dimensions.

A lake formed in such a manner would certainly put a sudden stop to the downwearing effects of deflation.

Mr. H. G. Lyons,[1] on the other hand, in an article written many years before, states that during the erosion of the Nile Valley the cutting-back of the escarpment separating the overlying limestones from the underlying Nubian sandstone encroached upon the southern limit of the oases, and let loose springs which greatly increased the rate of erosion. This would appear to be a case where the presence of ground-water facilitated erosion.

Again, Mr. F. J. Bennett,[2] in 1908, seems to have the germ of the same idea, when, discussing the solution-subsidence valleys and swallow holes within the Hythe Beds area of West Malling and Maidstone, England, he suggests that the "upward hydrostatic action of water under pressure . . . . is a new contributing factor in valley formation, and that this in conjunction with subaerial stream erosion" formed the valleys and swallow holes described. This, however, is an application to a region of normal rainfall and is not strictly à propos.

The idea advanced by Mr. Beadnell may be applicable to other desert regions. It is, at any rate, worth considering, in connection with Mr. Keyes's article, as a possible *modus operandi* of one limiting effect of ground-water upon wind erosion.

---

[1] "On the Stratigraphy and Physiography of the Lybian Desert of Egypt," *Quart. Jour. Geol. Soc.*, L (1894), 531–47.

[2] "Formation of Valleys in Porous Strata," *Geog. Jour.*, XXXII (1908), 277–88.